



CHARACTERIZATION AND STABILITY STUDIES ON BETALAIN PIGMENTS ISOLATED FROM FREEZE- DRIED RIVINA HUMILIS BERRY

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ABSTRACT

*Rivina humilis* (pigeonberry) berries are a rich source of betalains. This study investigated the characterization, and stability of betalains from freeze-dried berries. The findings highlight that during refrigerated storage, the freeze-dried extract exhibited the greatest stability at pH 5–6, retaining higher absorbance values over seven days, while increased pigment degradation was observed under highly acidic (pH 3) and alkaline (pH 8) conditions.

INTRODUCTION

- *Rivina humilis* is an underutilized Caribbean plant with red berries rich in betalains [1].
- It grows in colonies in various shaded soil environments [2].
- Betalains are nitrogen-containing pigments
- They are classified into betacyanin (red) and betaxanthin (yellow or orange)
- Reported benefits antioxidant properties and antimicrobial properties [3].
- The plant is used in traditional medicine.

MATERIALS & METHODS



RESULTS

Table 1. Changes in average absorbance of freeze-dried extract at different pH values at 4 °C

| pH | Day 1  | Day 2  | Day 3  | Day 6  | Day 7  |
|----|--------|--------|--------|--------|--------|
| 3  | 0.4884 | 0.4574 | 0.4068 | 0.2798 | 0.2225 |
| 4  | 0.5962 | 0.5866 | 0.4668 | 0.3674 | 0.3346 |
| 5  | 0.9357 | 0.6122 | 0.5668 | 0.4549 | 0.4387 |
| 6  | 0.6162 | 0.5991 | 0.561  | 0.4641 | 0.4278 |
| 7  | 0.5751 | 0.5751 | 0.4437 | 0.3532 | 0.3796 |
| 8  | 0.5655 | 0.5655 | 0.3842 | 0.295  | 0.2602 |

CONCLUSION

The freeze-dried extract demonstrated the highest stability during refrigerated storage at pH 5–6, while both highly acidic and alkaline conditions accelerated pigment degradation, highlighting the importance of pH in preserving pigment stability.

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